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(57) Abstract:

PURPOSE: To simplify a process by directly etching silicon or an silicon nitride thin-film through electron-beam assisting etching.

CONSTITUTION: XeF₂2202 is introduced into a reaction-gas material housing chamber 201, and a substrate 205, to an upper layer thereof an Si thin-film is formed, is set to a sample base 204. An electron-beam projection system 210 and a sample chamber 208 are evacuated up to a high vacuum of approximately 10⁻⁵ Torr or higher. A reaction gas material XeF₂ exists as a solid in atmospheric air but easily sublimates by an evacuation, and passes through a piping 203, and the inside of a by-sample chamber 206 is filled with XeF₂ as a reaction gas. The substrate 205, to the upper layer thereof the Si thin-film is shaped, is irradiated by electron beams focussed through a pin hole 207, and the Si thin-film at a position irradiated is etched.

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